

FARLEY

EXHIBIT J

found in a wide variety of animals and some foodstuffs. The way it is transmitted to healthy people is unknown. It has also been associated with the ingestion of contaminated foodstuffs, such as fresh cheese, milk and vegetables, resulting in various epidemics.⁶⁻⁸

Most severe infections caused by *Listeria* occur in neonates or in immunocompetent hosts. Resistance to *Listeria* infection resides in T lymphocytes,^{9,10} which explains why the most susceptible patients are those who have compromised T lymphocyte function. It is possible that there was a transient alteration in T cell function caused by the hepatitis A virus during the incubation period that resulted in increased susceptibility to *Listeria* infection and meningitis in our patient. Listeriosis has only rarely been described in relation to viral infections accompanied by immunosuppression as occurs with infectious mononucleosis, mumps or chickenpox.¹⁰ We have failed to find any reported case associated with hepatitis A infection.

We report this case for three reasons: (1) the exceptional relationship between both diseases; (2) the need to think of resistant bacteria such as *Listeria* when a patient is not responding to cephalosporin therapy for meningitis; and (3) the importance of evaluating even seemingly unimportant historic data, such as a brother with an acute hepatitis A infection.

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CUTANEOUS NEONATAL HERPES SIMPLEX INFECTION ASSOCIATED WITH RITUAL CIRCUMCISION

Neonatal herpes simplex infection is a potentially life-threatening infection occurring in infants younger than 4 to 6 weeks of age. Disease classically takes one of three forms: localized skin, eye, or mucous membrane infection; disseminated infection; or central nervous system infection. The virus is most commonly acquired during delivery through contact with infected secretions from the maternal genital tract. Postnatally acquired neonatal infection occurs rarely. Sources of postnatal transmission consist of maternal lesions including breast or oral lesions, other adults with physical contact with the baby including hospital personnel caring for the neonate² and possibly infant to infant in the nursery.³ We report two neonates with cutaneous herpes simplex infection involving the genital area with an onset several days after ritual circumcision. Both procedures were performed by the same individual; part of the ritual involved oral contact with the penis of the neonate after removal of the foreskin.

Case reports. Infant 1. In 1988 Infant 1 was born by normal vaginal delivery after a 37-week gestation with a birth weight of 3.3 kg. Prenatal history was unremarkable. There was no maternal or paternal history of oral or genital herpetic infection. The infant was breast-fed and had an unremarkable perinatal course. At 8 days of age his ritual circumcision was performed by a moher, an individual trained to perform circumcision as part of a religious ceremony. Four days later he developed erythema, swelling and a purulent yellow discharge from the glans of the penis and fever to 103°C. At 13 days of age he was admitted to Schneider Children's Hospital where physical examination showed a nontoxic appearing infant with a weight of 2.8 kg. Abnormal findings were limited to the penis which appeared erythematous with a yellow discharge. Total leukocyte count was 32,500/mm³ with a differential count of 64% polymorphonuclear leukocytes, 10% band forms, 10% lymphocytes, 10% monocytes and 6% atypical lymphocytes. Chest radiograph was normal. Cerebrospinal fluid (CSF) examination showed 3 leukocytes and 60 erythrocytes/mm³. Blood, CSF and a swab of the penile discharge were cultured and the patient was treated with ampicillin, nafcillin and gentamicin. Blood culture was negative, CSF grew *Staphylococcus haemolyticus* and the penis culture grew *Staphylococcus epidermidis* and *Escherichia coli*. Fever resolved within 48 h. Pustules were noted on the buttocks and papulovesicular lesions adjacent to the scrotum on the third hospital day. On the fifth hospital day a Tzanck preparation obtained from a vesicular lesion near the scrotum showed multinucleated giant cells; intravenous acyclovir was started at 30 mg/kg/day for treatment of presumptive herpes simplex infection. Herpes simplex virus (HSV) type 1 was isolated from skin lesions in the anterior perineum and buttocks and from a rectal swab. Papulovesicular lesions also appeared on the scrotum and penis. Eye examination was normal. Acyclovir was continued for 14 days with resolution of lesions. Maternal serology for HSV type 1, obtained near the end of the infant's hospitalization, was negative. At 10 years of age the child is normal and has not had recurrent herpetic lesions.

Infant 2. In 1998 Infant 2 was born by normal vaginal delivery to a 22-year-old gravida 1 para 1 woman after an unremarkable prenatal course. There was no maternal or paternal history of oral or genital herpetic lesions. The infant was breast-fed and discharged at 2 days of age. At 8 days of age his ritual circumcision was performed by the same moher who circumcised Infant 1. At 11 days of age swelling of the penis was noted; 2 days later low grade fever developed, and

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The study was conducted at the Corporación para Investigaciones Biológicas in Medellin, Colombia, and the patients were referred for evaluation from private pediatricians' offices or local clinics to this research facility. Institutional review board approval was obtained at the Corporación para Investigaciones Biológicas. Written informed consent was obtained from a parent or legal guardian.

To be included in the study patients had to have signs and symptoms of AOM by history such as fever, lethargy, irritability or otalgia associated with otoscopic findings of middle ear effusion by pneumatic otoscopy and evidence of erythema with or without bulging of the tympanic membrane.

Patients were excluded if they had a perforated tympanic membrane; had received treatment with a systemic antimicrobial agent in the last 7 days or with a long-acting parenteral antibiotic (i.e. benzathine penicillin) within the previous 4 weeks before enrollment in the study; had known renal or hepatic disease, pregnancy, history of hypersensitivity to a penicillin or cephalosporin; previous participation in this study; or known severe immunodeficiency.

On the day of enrollment a complete medical history and physical examination were performed and study drug was dispensed as a 250-mg/5 ml cefprozil suspension. After the first dose of 15 mg/kg patients were randomly assigned to have MEF, and serum samples were obtained at 1, 2, 4 or 6 h after administration of the dose. The goal was to have 10 patients at each of these time points.

From 20 to 30 min before tympanocentesis the patients received midazolam (0.5 mg/kg po) for sedation. The MEF was aspirated through a 20-gauge spinal needle attached to a sterile tympanocentesis trap (Julian Tym-Tap, Xomed-Treare). Plasma and MEF specimens were stored at -70°C. The concentrations of cefprozil in serum and MEF were determined by a standard disk diffusion microbioassay using *Micrococcus luteus* (ATCC 9341) as the test organism.^{5,6} The lowest concentration of cefprozil detectable in MEF was 0.1 µg/ml. To correct for the presence of blood in MEF, the hemoglobin concentration in MEF was measured by colorimetric technique based on the catalytic action of hemoglobin

Primary Genital Herpes Simplex Infection Associated with Jewish Ritual Circumcision

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Circumcision is a common custom in many cultures. Complications of the procedure include adhesions, infection, hemorrhage, urinary retention, acute renal failure, and rarely, necrotizing fasciitis [1]. A recent study in Israel showed that urinary tract infection occurs more frequently after traditional circumcision performed by a *mohel* (Jewish Orthodox ritual circumciser) than after circumcision performed by a physician [2]. In this article we describe a case of primary neonatal herpes simplex infection associated with ritual circumcision.

Patient Description

An 18 day old boy was admitted to our department with a 3 day history of vesicular and pustular eruption on the penis, buttocks and left thigh. He was the product of a normal pregnancy and vaginal delivery and was born at 41 weeks gestation with a birth weight of 3.350 kg. The mother was a healthy 22 year old, gravida 1, para 1. The baby was breast-fed. There was no history of exposure to herpes virus or of oral or

genital lesions in the parents. At the age of 8 days, the infant underwent circumcision by a *mohel* in the community.

Physical examination revealed no abnormalities except for several pustules on the penis (Figure A), which was also edematous and dorsally deviated. Three vesicles with erythematous borders were also seen on the buttocks and left thigh (Figure B). There was no fever, apathy, or feeding disturbance. Because primary herpetic infection was suspected a sepsis workup was performed.

Laboratory tests showed a white blood cell count of $11,430/\text{mm}^3$ with 35% polymorphonuclear leukocytes, 51% lymphocytes, 11% monocytes, 2% eosinophils and 1% basophils. Blood chemistry (SMA-18) was normal, including liver enzymes. Cerebrospinal fluid examination showed 25 cells (mainly mononuclear), protein 54 mg/dl and glucose 36 mg/dl. Blood, urine and CSF cultures were negative. Cultures of

fluid aspirated from a pustule on the penis grew HSV type I and *Klebsiella pneumoniae*. Serology for HSV-I showed high immunoglobulin M titers and moderate IgG titers. In addition, the serum was positive for HSV type II IgM but negative for IgG antibodies.

The patient was treated with intravenous acyclovir (30 mg/kg/day) and cefamizine (50 mg/kg/day) for 10 days and garamycin (5 mg/kg/day) for the first 3 days. Mupirocin (2%) was applied locally. Marked clinical improvement was observed within 4 days, with drying and crusting of the vesicles and pustules, although dorsal deviation of the penis persisted. A consulting urologist diagnosed dorsal chordee and recommended follow-up with possible surgical repair at a later date. The patient was discharged after 10 days in good condition.

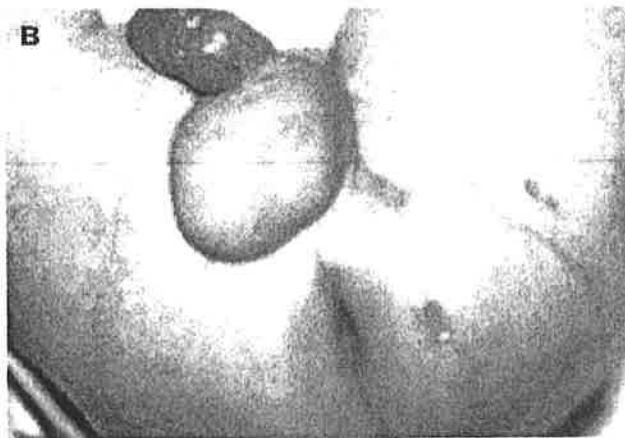
During the next month the patient had two recurrences of lesions on the penis and thighs. However, his general condition was excellent, and he was treated with 5%

CSF = cerebrospinal fluid

HSV = herpes simplex virus
Ig = immunoglobulin



[A] Vesicular lesions on the penis.



[B] Lesions on the buttocks.

acyclovir ointment. The patient was readmitted 6 weeks after discharge with low grade fever and a few dry vesicles on the penis and perineum and sent home after 24 hours observation with a prescription for local acyclovir treatment. During this hospitalization, repeated serologic tests showed high IgM and IgG titers for HSV-I but no detectable antibodies for HSV-II. The parents underwent serologic tests for HSV-I and II and were found to be negative. A request for HSV serology or saliva culture for herpes was refused by the *mohel*.

Comment

Two types of HSV have been identified: type I, which is associated mainly with infections of the mouth, lips, eyes and central nervous system, and type II, which is associated mainly with genital infection and infections in the prenatal or perinatal period. In neonates, the source of infection is usually the maternal genital tract, and the transmission occurs during delivery. Up to 75% of infections in neonates is with HSV-II. Primary or re-infection of the maternal genital tract may be present without symptoms of signs, and 0.01–0.4% of women shed HSV at delivery. Maternal primary genital herpes has a transmission rate of 33–50% to the newborn, whereas recurrent maternal disease has an attack rate of only 1–3%. Occasionally newborns may be infected postnatally by the mother or other persons who came into close contact with them. In our case, the presence of HSV type I infection of the penis in an 18 day old infant raised suspicions that it was related to the circumcision performed a few days earlier. This assumption was supported by several factors: a) the lack of history of genital or perioral herpes infection in the mother or father, b) the negative serology for HSV in the parents, and c) the finding of the type I strain while 80% of neonatal herpetic infections are due to type II strain. The initial detection of IgM antibodies for both HSV type I and type II in our patient could be explained by the known cross-reactivity among herpes virus antibodies [3]. The timing of the disease also favored a

possible epidemiologic link to the circumcision, since the incubation period for herpes infection is 2–12 days. Circumcision in our patient was performed on the eighth day after birth in accordance with Jewish Orthodox custom, and the lesions appeared 7 days later on the penis and buttocks.

During traditional circumcision, the *mohel* may perform *metsitsah*, a sucking on the circumcised bleeding penis. This ritual is described as an integral part of the circumcision ritual from its earliest religious description, and is considered to be obligatory. Therein lies the difficulty in persuading *mohalim* to eliminate *metsitsah* from the circumcision ritual. A possible explanation behind the ritual is that sucking the blood demonstrates that a procedure has been performed. Another modern explanation is that the *mohel* applies natural anticoagulants and antibacterial agents to the open wound. However, we believe this is a source of infection rather than an effective protective measure.

Several cases of transmission of infectious diseases during ritual circumcision have been documented. In 1999, HSV infection of the penis was described in two infants who underwent ritual circumcision including *metsitsah* [4]. Neither patient had a parent with a previous herpes infection. The first infant presented 4 days after circumcision with an erythematous, swollen penis and a purulent discharge from the glans. The second infant presented 3 days after circumcision with a similar picture. Viral culture grew HSV-I from skin lesions of both infants. Recurrent cutaneous lesions appeared in the genital area several months later. Both circumcisions were performed by the same *mohel*, who denied a history of oral herpes infection [4]. However, excretion of the HSV in the saliva of seropositive asymptomatic subjects is a proven phenomenon [5], and HSV can be cultured from the pharynx of 1–2% of asymptomatic seropositive individuals.

Other infectious diseases transmitted during ritual circumcision (and *metsitsah*) are syphilis and tuberculosis [4]. The risk of infection is bi-directional; the *mohel* also

risks being infected by blood-borne pathogens from the neonate, including hepatitis and human immunodeficiency virus.

To minimize the contact between the *mohel's* mouth and the freshly circumcised penis – and thereby, the risk of infection – many communities today have introduced the use of a sterile glass pipette. However, in our case, *metsitsah* was performed without any device.

In conclusion, *metsitsah* performed as part of Jewish ritual circumcision involves orogenital contact and is thus associated with a risk of pathogen transmission between *mohel* and neonate. This is a real epidemiologic problem considering the thousands of circumcisions performed with *metsitsah*. We suggest that the public consider a modified procedure without *metsitsah* or with *metsitsah* through a glass pipette.

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Neonatal Genital Herpes Simplex Virus Type 1 Infection After Jewish Ritual Circumcision: Modern Medicine and Religious Tradition

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ABSTRACT. *Objective.* Genital neonatal herpes simplex virus type 1 (HSV-1) infection was observed in a series of neonates after traditional Jewish ritual circumcision. The objective of this study was to describe neonate genital HSV-1 infection after ritual circumcision and investigate the association between genital HSV-1 after circumcision and the practice of the traditional circumcision.

Methods. Eight neonates with genital HSV-1 infection after ritual circumcision were identified.

Results. The average interval from circumcision to clinical manifestations was 7.25 ± 2.5 days. In all cases, the traditional circumciser (the *mohel*) had performed the ancient custom of orally suctioning the blood after cutting the foreskin (oral *metzitzah*), which is currently practiced by only a minority of *mohels*. Six infants received intravenous acyclovir therapy. Four infants had recurrent episodes of genital HSV infection, and 1 developed HSV encephalitis with neurologic sequelae. All four *mohels* tested for HSV antibodies were seropositive.

Conclusion. Ritual Jewish circumcision that includes *metzitzah* with direct oral–genital contact carries a serious risk for transmission of HSV from *mohels* to neonates, which can be complicated by protracted or severe infection. Oral *metzitzah* after ritual circumcision may be hazardous to the neonate. *Pediatrics* 2004;114:e259–e263. URL: <http://www.pediatrics.org/cgi/content/full/114/2/e259>; *ritual circumcision, herpes simplex infection, infection of the newborn, Jewish tradition*.

ABBREVIATIONS. HSV, herpes simplex virus.

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Biblical sources dictate routine ritual circumcision at 8 days of age for Jewish boys. This procedure is widely accepted, and 60% to 90% of newborn boys of the Jewish population in the United States undergo this procedure,^{1,2} which also has an important cultural and historical role. The medically beneficial versus harmful consequences have long been debated.³ Circumcision has been reported to reduce the incidence of urinary tract infections in infants,⁴ young boys under the age of 2 years,⁵ and preschool boys.⁶ Pathologic phimosis and paraphimosis is precluded by the absence of a foreskin, and balanitis and posthitis (inflammation of the prepuce) primarily affect uncircumcised male individuals. Virtually all sexually transmitted diseases,⁷ including human immunodeficiency virus infection,^{6,8} are reported to be more common in uncircumcised men.

Both immediate and long-term complications of ritual circumcision are rare, probably because of the specific and meticulous precautions required by Jewish law. Only an experienced and qualified circumciser, the *mohel*, is allowed to perform circumcision. Historically, Jewish ritual circumcision consists of 3 parts: 1) the excision of the outer part of the prepuce (*milah*), 2) slitting of the foreskin's inner lining to facilitate the total uncovering of the glans (*peri'ah*), and 3) the sucking of the blood from the wound. Formerly, the *mohel* took some wine in his mouth and applied his lips to the part involved in the operation and exerted suction, after which he expelled the mixture of wine and blood into a receptacle provided for this purpose; this procedure was repeated several times until bleeding stopped (*metzitzah*). The first 2 parts are the act of circumcision, whereas the removal of the blood was done for medical reasons of wound care. However, the ancient procedure of *metzitzah* also carries a risk of infection, and currently most *mohels* use an appropriate suction device, such as a mucus extractor.

The incidence of neonatal herpes simplex virus (HSV) infections ranges from 1 to 6 per 20 000 live births. Most neonatal HSV infections result from exposure to infectious maternal genital secretions at delivery. Postnatal transmission usually results from nongenital infection of a caregiver, including parent or nursery personnel with oral lesions.⁹ Nosocomial transmission in nurseries has been documented.⁹ We present 8 infants who developed neonatal HSV-1

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METHODS

Neonates who developed genital HSV-1 infection after circumcision from the following medical centers were evaluated: Soroka University Medical Center (Beer Sheva, Israel); Safra Children's Hospital, Sheba Medical Center (Tel Aviv, Israel); Hadassah Hospitals at Mt. Scopus and Ein Kerem (Jerusalem, Israel); and the Hospital for Sick Children (Toronto, Ontario, Canada). There is no official registry in the United States or in Israel to document the incidence of medical complications after ritual circumcision. The percentage of *metzitzah* performed by oral versus instrumental suction could not be evaluated statistically. The 8 cases were collected from personal communication and the experience of the authors from 1997 to 2003. Clinical data from all patients were collected, and follow-up was conducted during hospitalization and after the discharge of the infants from the hospital.

Identification of herpesvirus from lesions was performed by microscopic examination of Tzanck preparations and electron microscopy of specimens directly from the lesions. The virus was determined to be HSV-1 by immunofluorescence microscopy, isolation in cell culture, or polymerase chain reaction. HSV serostatus and seroconversion were determined by complement fixation or enzyme immunoassays. In all cases, the details of the circumcision procedures were reviewed. When possible, the *mohel* was tested for virus shedding in saliva and for HSV serostatus. Tests were performed separately in the diagnostic virology laboratory routinely used by each hospital.

RESULTS

Eight neonates with documented genital HSV-1 infections were identified (Table 1). In all cases, the *mohel* had performed the ancient custom of oral *metzitzah*. On 2 occasions, the same *mohel* performed the circumcision in 2 different infants: patients 1 and 4 (an interval of 5 years) and patients 7 and 8 (an interval of 5 weeks).

The mean birth weight was 3220 g (standard deviation: ± 696). The circumcision of patient 1 was delayed because he was born prematurely, and the circumcision of patient 3 was delayed because of suspected sepsis. All other infants were circumcised on day 8 of life. The mean interval from circumcision to HSV clinical infection was 7.25 ± 2.5 days. On admission, all infants were reported to have poor appetite. Mean temperature was $37.8 \pm 0.8^\circ\text{C}$. Vesicular rash over the scrotum and penis was noted in all patients (Fig 1). In 5 patients, Tzanck preparation was performed and showed cellular changes consistent with herpesvirus; in 1 case, herpes group virus was detected by negative contrast electron microscopy. HSV was isolated from all patients. None of the mothers had clinical evidence of oral or vaginal herpes. Most infants and their mothers were seronegative for HSV; only patient 7 and his mother were seropositive with a titer of 1:16. In patient 7, a cerebrospinal fluid sample was positive for HSV-1 by polymerase chain reaction, consistent with the clinical course and radiologic diagnosis of HSV encephalitis.

Six infants were admitted to the hospital and received intravenous acyclovir therapy. Four infants had recurrent episodes of genital herpes, and 1 infant presented with severe encephalitis followed by long-term neurologic sequelae, including seizures. Only four *mohels* could be tested, and they were found to

be seropositive ($n=1/4$); the saliva samples obtained from *mohels* all were negative for HSV.

DISCUSSION

In the 8 infants presented here, the association between genital HSV-1 infection and the performance of the ancient procedure of oral *metzitzah* during the circumcision is strongly suggested on the basis of the following criteria: exclusive genital distribution of the lesions, timing of their appearance (4–11 days after circumcision), isolation of HSV-1, absence of HSV exposure in mothers (based on both clinical observation and negative serology in most of the mothers), and absence of clinical signs and symptoms consistent with HSV infections among family members. Furthermore, although the oral *metzitzah* is performed by only a minority of *mohels*, all infants described here underwent this procedure.

On 2 occasions, patients 1 and 4 and patients 7 and 8, the circumcision was performed in different infants by the same *mohel*. On 1 occasion, the interval between the 2 cases was 5 weeks; in the other, 5 years. In previous reports, HSV-1 genital infection occurred in 2 infants who were circumcised by the same *mohel* 10 years apart.^{10,11} Because HSV-1 can be secreted intermittently in saliva for several days to weeks, it is likely that other infants were infected. We suspect, therefore, that this entity is underreported for cultural reasons and that the studies described here are only the “tip of the iceberg” of the true incidence of the disease.

Because in every case the *mohel* had removed the blood by mouth after cutting the foreskin, it was most likely that the infection was transmitted directly from this oral or salivary contact. All of the *mohels* who consented to be tested were seropositive. The likelihood of other sources for an HSV-1 infection in the area of the glans penis in the region of the wound of the circumcision is minimal.¹² Because shedding of HSV-1 in the saliva of both symptomatic and asymptomatic individuals has been documented repeatedly, the act of *metzitzah* represents a potential source of orogenital transmission to the nonimmune infant whose skin integrity was disrupted by circumcision, especially if the infant is seronegative for HSV.

The genital infection in 7 patients remained localized, but patient 7 developed HSV encephalitis followed by long-term brain damage manifested by seizures and infantile spasms. Four infants experienced recurrent episodes of genital herpes simplex and received long-term prophylaxis with oral acyclovir.

In the past, reports of HSV genital infections after circumcision have been relatively rare, not withstanding the high frequency of active herpes labialis among the population, which would include the *mohels*.¹⁰ This may be accounted for in part by the observation that all but 1 of these cases were seronegative for antibody to HSV, which suggests that seropositive infants might be protected to some degree. Likewise, the practice of oral *metzitzah* is limited to only a small subset of ritual circumcisions. There is, however, the possibility that some previous

TABLE 1. Clinical and Laboratory Findings of 8 Neonates With Genital HSV-1 Infection After Ritual Circumcision Followed by Oral Metzitzah

Year	Patient							
	1997	1994	2000	2002	2001	1999	2002	2001
Admitting hospital	Hadassah Mt. Scopus Jerusalem, Israel	Hospital for Sick Children, Toronto, Canada	Hadassah Ein Karem, Jerusalem, Israel			Soroka University Medical Center, Beer Sheva, Israel		Sheba Medical Center, Tel Aviv, Israel
Birth weight (gestational age)	1880 g (35 wk)	3980 g (41 wk)	3170 g (40 wk)	3475 g (40 wk)	3200 g (40 wk)	4100 g (42 wk)	3155 g (40 wk)	2800 g (40 wk)
Age (d) at circumcision	31	8	16	8	8	8	8	8
Days from circumcision at presentation	4	9	4	9	6	11	8	7
Temperature	38.0°C	38.1°C	38.2°C	38.5°C	36.1°C	37.0°C	38.0°C	38.4°C
Serology of mother (infant)	Negative (negative)	Negative (negative)	Negative (negative)	Negative (negative)	Negative (negative)	Negative (negative)	Positive 1:16 (positive 1: 16)	Negative (negative)
Serology <i>mozel</i>	N/A†	Positive (>1:64)	N/A	N/A†	N/A	Positive	Positive (1:64)*	Positive (1.64)*
Initial treatment (acyclovir in mg/kg/day)	IV acyclovir × 8 d	IV acyclovir × 26 d × 10 d	IV acyclovir × 10 d + PO acyclovir × 14 d	IV acyclovir × 8 d + PO acyclovir × 2 d	No treatment	No treatment	IV acyclovir × 21 d	IV acyclovir × 14 d
Course and treatment	4 recurrences over 8 mo; treated with PO acyclovir × 4 d	Discharged after 26 d IV acyclovir, no neurologic deficit; treated with local acyclovir ointment	5 episodes over 20 mo, treated with local acyclovir ointment	3 episodes over 7 mo, treated with local acyclovir ointment	Spontaneous recovery	Spontaneous recovery	4 d in intensive care unit as a result of seizures (same dosage of acyclovir)	5 more episodes over 11 mo with positive HSV cultures from lesions; treated with PO-acyclovir × 7–14 d
Long-term outcome	Prophylactic treatment with acyclovir for 1 y, normal development	N/A	Delayed psychomotor development	N/A	>2 mo N/A	> 3 mo N/A	Infantile spasm, hipsarrythmia	Prophylactic treatment with acyclovir, normal development

IV indicates intravenous; PO, oral; N/A, not available.

* Same *mozel* for patients 7 and 8 with an interval of \pm 5 weeks.† Same *mozel* for patients 1 and 4 with an interval of 5 years.

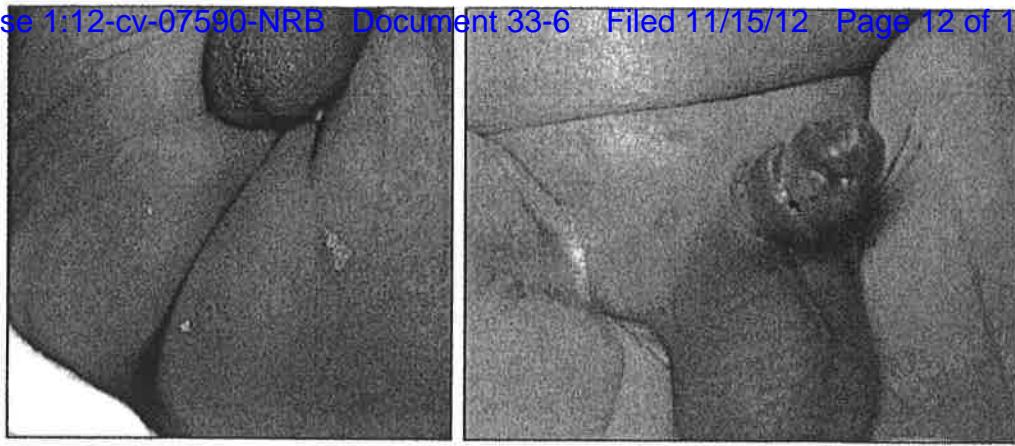


Fig 1. Genital HSV-1 infection after ritual circumcision (from patient 6).

cases were not reported for cultural reasons. To clarify this statement, the cultural background requires elaboration.

According to Biblical law, a male infant should be circumcised at the age of 8 days as a sign of the eternal covenant between God and the Jewish people (Genesis 17:10–14; Leviticus 12:3). According to classical rabbinical interpretation, performance of this religious ritual offers medical advantages, a view upheld by many modern medical authorities, as noted earlier. The Babylonian Talmud (Sabbath 133b), the main rabbinical literature completed in the fifth century of the common era, states that for the sake of the infant, the *mohel* is obliged to perform the *metzitzah* "so as not to bring on risk." The nature of the risk was not specified. It specifically states that "this procedure is performed for the sake of the infant's safety and if a *mohel* does not perform the suction [of the wound], this is deemed dangerous and he is to be dismissed." To prevent medical complications, the Talmud permits only an experienced and responsible *mohel* to perform the ritual circumcision. The Talmud (Tossefta Shabbath 15:8) was aware of potential medical problems that could arise from ritual circumcision¹³ and in fact provided the first description of hemophilia in the history of medicine, manifested as a familial bleeding disorder that required circumcision to be postponed.¹⁴

In the 19th century, Ignaz Philipp Semmelweis (1818–1865) established the principles of hygiene and disease transmission,¹⁵ after neonatal tuberculosis was documented after circumcision by an infected *mohel*.¹⁶ Since then, most rabbinical authorities modified their approach in response to these findings. Because the Talmudic injunction to perform *metzitzah* did not explicitly stipulate oral suction, >160 years ago, Rabbi Moses Schreiber (Pressburg, 1762–1839), a leading rabbinical authority, ruled that *metzitzah* could be conducted by instrumental suction,¹⁶ a ruling quickly adopted by most rabbinical authorities.¹⁷ Consequently, the great majority of ritual circumcisions are performed today with a sterile device and not by oral suction by the *mohel*. However, some orthodox rabbis have felt threatened by criticism of the old religious customs and strongly

resist any change in the traditional custom of oral *metzitzah*. The cultural process of replacing ancient customs by modern wound care has to be encouraged by a heightened awareness of this potentially life-threatening medical complication.¹⁶

On the basis of our observations, the medicolegal impact of neonatal infection by the *mohel* has to be redefined. Our findings provide evidence that ritual Jewish circumcision with oral *metzitzah* may cause oral–genital transmission of HSV infection, resulting in clinical disease including involvement of the skin, mucous membranes, and HSV encephalitis. Furthermore, oral suction may not only endanger the child but also may expose the *mohel* to human immunodeficiency virus or hepatitis B from infected infants. The same consideration that led the Talmudic sages once to establish the custom of the *metzitzah* for the sake of the infant could now be applied to persuade the *mohel* to use instrumental suction.

Indeed, after our first cases, the Chief Rabbinate of Israel pronounced in 2002 the legitimacy of using instrumental suction in cases in which there is a risk of contagious disease. We support ritual circumcision but without oral *metzitzah*, which might endanger the newborns and is not part of the religious procedure.

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